Caught Between Theory and Practice: Government, Market, and Regulatory Failure in Electricity Sector Reforms

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Abstract

Electricity sector reforms in many developing countries since the early 1990s have revealed the complexities of introducing market-based reforms in network and infrastructure industries. This paper reflects on the experience to date with the process and outcomes of electricity reforms in smaller electricity systems of less-developed and transition economies. In particular, we use case studies of Belarus and Nepal, two countries that in many respects reflect the current state of reform efforts but have not received much scrutiny in the literature. The evidence suggests similarities in the electricity sectors of less-developed and transition economies, even though the contexts vary significantly. The need to balance economic efficiency, sustainability and social equity, and to maintain adequate investment, remains challenging despite more than two decades of experience with reforms. The dynamics of the electricity supply industry and policy objectives imply that reforms evolve continuously and thus remain work in progress, and their success or failure is a complex function of micro- and macro-economic as well as institutional factors.

Keywords: market liberalisation, electricity restructuring

JEL Classification: L52, L94, P00

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1. Introduction

A combination of factors such as political ideology, economic rationalism and technological innovations induced a remarkable worldwide experiment of introducing market-based reforms and restructuring of the electricity sector starting in the early 1980s. The importance of the electricity industry in social welfare and economic development alongside the public utility characteristics of the sector imply that reforms of the sector have significant and broad implications (Victor and Heller, 2007). Hence, the lessons of experience to date with reforms in the sector can serve as important economic and political tests for governments.

Reforms of the public utilities and infrastructure industries such as electricity have required significant expenditures and effort across the reforming countries (Laffont, 2005). While they have induced improvements in technical and operational efficiency in the sector in a number of reforming countries, there is no theoretical or empirical consensus regarding the economic gains. Productive and operational efficiency in many developed and transition countries seem to have improved, although allocative efficiency deteriorated early in the reform process [1] (Jamasb et al., 2005a). For example, microeconomic reforms in the Australian East Coast electricity sector corrected pricing practices and capital allocation leading to removal of excess generation capacity (Simshauser, 2006). However, it is difficult to distinguish the gains in productive efficiency resulting from technological improvements or from adoption of reforms. In many developing countries, efficiency improvements have not been realized, while the inefficiencies in the sector were a drag on economic growth and an obstacle towards reducing poverty and income inequality.

A market-driven model in the power sectors of less-developed countries seems to have been limited after more than two decades of reforms (Besant-Jones, 2006; Kessides, 2012). In transition economies of the CIS region, the process has been erratic, heterogeneous and marked by political reluctance, resulting in slow

[1] The transition countries include 29 (now 34) countries of Central Eastern Europe and Baltic States (CEB), South Eastern Europe (SEE), central Asia and Commonwealth of Independent States (CIS) based on European Bank of Reconstruction and Development (EBRD) classification.

implementation (Williams and Ghanadan, 2006). There is a wide variation in the progress with the implementation even within the EU, where compliance with various EU directives does not necessarily imply a thorough reform (Newbery, 2002; Pollitt, 2009a, Pollitt, 2012).[2] In the US, reforms have generally not performed well, even though progress has been made in removing the costly price and entry regulation affecting almost every energy sector directly or indirectly over the last nearly four decades (Joskow, 2009). In Australia, the gains in the wholesale market have been laregely exhausted while above trend growth in energy infrastructure investments is escalating the retail prices to unsustainable levels (Simshauser and Downer, 2012).

Most notably, the UK, one of the pioneers, proposed a new electricity market reform that signalled intent for significant government intervention in order to meet its climate change objectives (DECC, 2011). The UK experience has coincided with the renationalization of energy industries in Latin American countries (LACs) including Bolivia, Venezuela and the Dominican Republic also has underscored an increased role for the state (Balza, Jimenez and Mercado, 2013). Argentina, once at the forefront of market-based reform, is systematically undermining the role of markets in the energy sector (Littlechild, 2013). These experiences have revealed the considerable complexities in implementing market driven reforms, notwithstanding the theoretical arguments in favour of transitioning to the market over the past decades.

Investment adequacy has been a constant source of concern in the liberalisation process in developed and developing economies. A major challenge in the transition to accelerating competition in the electricity sector has been that the effectiveness of regulation is constrained by weak institutional environments in developing and transition countries (Laffont, 2005). In the UK, incentive-based regulation of the monopoly electricity networks has resulted in significant efficiency improvements (Helm, 2009).

The drive towards market solutions are still on-going in the electricity sectors of many countries, and some observers regard the process as not only possible, but also

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[2] For example, Germany began the electricity market liberalisation process in 1998 without having an independent regulator in place. The regulator Bundesnetzagentur (BNETZA) was only created in 2005.

inevitable (Erdogdu, 2013). It is, therefore, useful to revisit the experience of the process and impacts of this trend and draw out lessons in the aftermath of this experiment. In general, successful electricity reforms should enhance the efficiency of the sector, improve electricity access and reliability, improve service quality, reduce the price-cost gap through cost-reflective pricing and increase investments (Sen and Jamasb, 2012).

This paper reflects on the process and outcomes of liberal electricity reforms and examines the evidence to date on market-driven sector reforms in smaller electricity systems in less developed and transition countries and based on country case studies.[3] Unlike earlier studies, this paper takes a step back to look at the underlying institutional processes, which differ between regions and have undoubtedly influenced the outcomes in small electricity systems although they have not been adequately studied or addressed in the literature. Thus the paper differs from the existing literature, which has tended to focus on comparisons between countries at different stages of reform and thereby taking reform per se as granted.

The remainder of the paper is structured as follows. Section 2 provides an overview of the market-based reform model. Section 3 discusses the context and drivers of reforms in developing, transition and developed countries. Section 4 presents the country case studies of the reform process, progress and outcomes. Section 5 details the lessons and policy implications based on these case studies. Section 6 concludes the paper with suggestions for further research.

2. Overview of the reform model

The early 1980s gave rise to the ‘standard textbook model’ for organizing and restructuring the electricity sectors in many countries around the world. Chile was the first developing country to apply the 'standard textbook model' in 1982. The Chilean reform involved the following sequential measures: i) establishment of an

[3] According to the systems classification criteria by Besant-Jones (2006), an electricity system is considered to be small if under 1,000 MW of total installed capacity in developing countries. However, we consider small electricity systems as being less than 10,000 MW in our analysis.

independent sector regulator, ii) corporatization of state-owned enterprise, iii) legislation for electricity sector liberalization, iv) unbundling (vertical separation) of the main segments, v) incentive regulation for electricity networks, vii) establishment of a wholesale electricity market, viii) privatization and ix) introduction of private Independent Power Producers (IPPs). The Chilean reform was soon followed by the UK (1990) and Norway (1991).

The success of the model in these countries under stable political and economic conditions signalled the potential of market-based reforms and incentive regulation to other countries around the world. This saw the advent of modern electricity reforms. Table 1 shows the market-oriented electricity reform steps in Argentina inspired by the Chilean model. The notable difference in the sequencing between Argentina and Chile is the introduction of IPPs before privatization.

Year	***Reform Steps***
1989	Corporatization
1992	Electricity Law
1992	Regulator (ENRE)
1992	Restructuring
1992	Incentive Regulation Price Cap (PCAP)+ regulated third party access (rTPA)
1992	Wholesale Competition Pool based on short-run marginal cost (SRMC) + contracts
1992	IPPs
1992-1993	Privatization Distribution (70%) in 1992, Generation (60%) in 1992 and Transmission (100%) between 1993-1996

Table 1: Electricity reform steps in Argentina based on the standard reform model
Source: Adapted from Jamasb (2006)

The first element of the reform model involved vertical separation or unbundling of the potentially competitive wholesale generation and retail supply activities from the natural monopoly transmission and distribution network segments. The model assumed that not all activities of the electricity industry are inherently monopolistic, and that electricity could be generated by competing firms in organised markets. It was believed that vertical separation of these distinct activities would guard against cross-subsidization between competitive businesses and regulated businesses and discriminatory practices such as denial of access to networks (Joskow, 2006).

The second component of the model underscored the important role of private ownership of the competitive segments of the ESI. This was based on the notion that private sector could better allocate scarce capital and resource and ensure more efficient management of the system. Privatisation of state-owned electricity monopolies was perceived to create hard budget constraints and higher-powered incentives for efficiency improvements. The increase in private sector involvement was expected make difficult for the state to use these industries to meet costly political agendas such as patronage employment, harmful macroeconomic and redistributive policies and national revenue diversion to government budgets outside of the tax system (Joskow, 2006). However, private ownership of the sector in countries such as Japan, Germany and the US had occurred before the 1980s and has been pervasive throughout the post-World War II period. Similarly, the success of the electricity reform in Norway with large local and regional government ownership shows that privatisation is not essential for a successful reform.

The third component focussed on creating effective institutions comprising an independent sector regulator. An independent regulator would act as the custodian of public interest (Armstrong et al., 1994). It was expected that an independent regulator with adequate staff, powers, duties and information about the costs, service quality and performance of the ESI would ensure proper conduct in the industry by effectively implementing the incentive based regulation of the monopoly segments in terms of the market entry, network charges and network access. It was assumed that incentive regulation of networks could approximate the efficiency of a competitive market (Littlechild, 1992). For example, the US already had independent state and federal energy sector regulators and private ownership since the early 20th century and some wholesale electricity markets prior to 1980s (Pollitt, 2011).

The remarkable pace and extent of the reforms were such that, by the end of the 1990s, many advanced economies and around 70 developing and transition countries had adopted some form of market driven steps in their electricity sectors (Steiner, 2001). The general tendency in these countries involved the progression from a vertically integrated state-owned monopoly towards an unbundled competitive market. Figure 1 shows that the process involved progressively introducing

competition in the generation, wholesale and retail level respectively. The single buyer model with IPP participation remains the dominant refrom model across many Asian and African countries, while the majority of LACs have pursued creating a competitive wholesale and retail market based on the standard model.

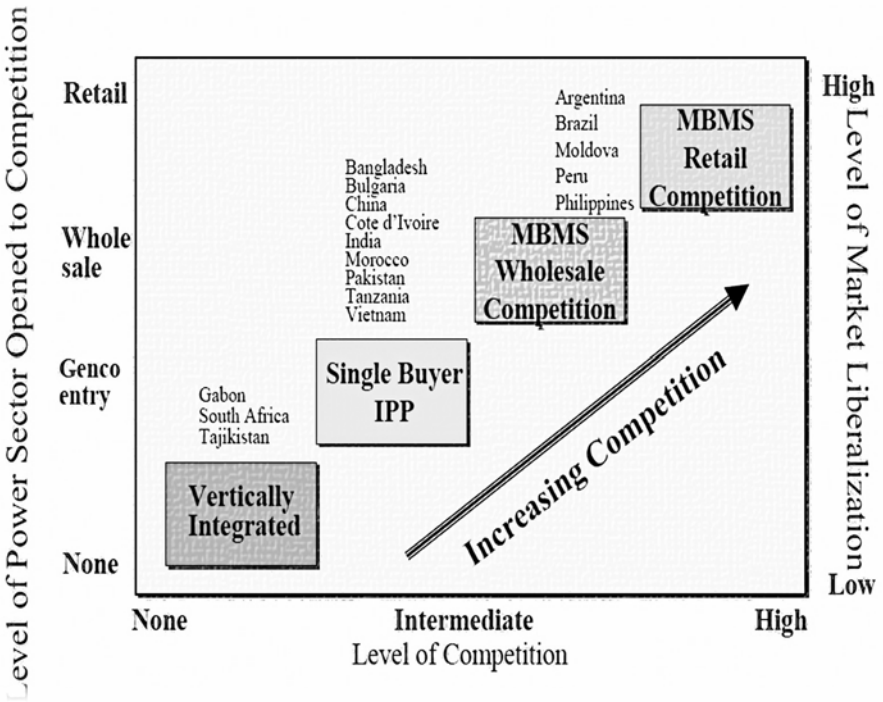

Figure 1: Electricity market models transitioning
Source: USAID (2004)[4]

3. Context and Drivers of Reforms

The initial conditions across the countries that implemented market-based electricity reforms varied significantly. Sector endowments, structure and institutional strength differed across these countries at the start of the process. The *initial sector structure* is a function of the sector's history and resource endowment at the time of reforms. The initial structure defines the starting point and the appropriate structure envisaged from the start of the process (Jamasb et al., 2005b). For example, the transition countries

[4] 'MBMS' stands for multi-buyer multi-seller.

adopted market-oriented electricity reforms but did not effectively create suitable institutions to support them.

The size of the electricity sector is a crucial but often ignored dimension of the literature. The size of the system can influence reform capabilities and reform options of the countries. Hence, not all elements prescribed by the standard textbook model can be suitably applied across all countries. For example, it is not clear if smaller systems such as the Nepalese electricity sector also require or benefit from vertical separation and third-party access in a developing country context. This is because the scope for competition may be limited implying that in small system the benefits of adopting a full reform package may be small in relation to the reform costs. It is not appropriate to unbundle a power system with less than 1000 megawatts (MW) of capacity into many separate generation and distribution companies based on the assumption that effective competition will develop (Besant-Jones, 2006).

The *institutional factors* refer to sector and economy level legal and regulatory frameworks that influence the continuity of the reform process. The reforms of sector regulation in developing countries have tended to suffer from low levels of institutional environment in terms of limitations in regulatory capacity, accountability, commitment and fiscal efficiency (Laffont, 2005). As a result, reforms can be ineffective and prone to political capture, becoming a tool of self-interest within the government or ruling elite (Stiglitz, 1998). In contrast, developed countries tend to have more robust institutional framework and arrangements in place as they have high institutional endowments, making the process comparatively more feasible.

Despite variations in the initial condition; a set of common drivers (within the sector and external) motivated the early reform process in developed and developing countries. Table 2 shows that the demonstration effect from early success stories was only one of the major drivers of spread of reforms around the world. The electricity sectors in developed countries were characterised by excess capacity coupled with the use of expensive generation technologies, productive inefficiency, and cross subsidies from residential customers to industrial users (Jamasb et al., 2005a). In developing countries, factors such as energy deficit; operational and economic inefficiency of state-led vertically integrated utilities; the inability of the state sector to raise adequate

capital; expanding electrification; the need to reform subsidies for better allocation of resources; and the desire to raise revenue through the sale of state assets were more important (Bacon and Besant-Jones, 2001).

Electricity sector drivers	***External drivers***
Developed countries: excess capacity, use of costly generation technologies, economic inefficiency, growing consumer demands for cheap energy *Developing countries:* burden of energy subsidies, low service quality, high energy losses, poor service coverage, capacity shortage and energy sector investment constraints	a) *Political and economic ideology*: faith on the forces of market, competition and privatization b) *Technological innovation*: such as the development of combined cycle gas turbines (CCGTs) c) *Macroeconomic events*: such as the post-Soviet economic transition (1989), Latin American debt crisis (1980s), Asian financial crisis (1997-1998) d) *Capital raising options and access to capital needs*: privatization of state owned energy assets e) *OECD energy deregulation*: creation of new energy multinationals looking for new investment opportunities f) *Lending policies*: such as those of the World Bank and IMF with strings attached g) *National economic reform context*: as a result of economic crisis and structural adjustment programs

Table 2: Drivers of power sector reforms
Source: Adapted from Nepal and Jamasb (2012a)

The appeal of utility privatisation was particularly strong among the transition countries. These economies experienced massive market-oriented systemic changes in all sectors of their economies from the early 1990s. The structural change included macro stabilization, price liberalization, eliminating institutions of state control over the economy, and openness to international trade. These reforms were also termed as Type I reforms while Type II reforms included the design and enforcement of laws, regulation and proper institutions to support and nurture the functioning of the market driven reforms (Svejnar, 2002). Large-scale economic privatization combined with the establishment of legal institutions in establishing well-defined property rights and contracts and anti-corruption agencies were the major hallmarks of the Type II reforms.

The shift from a vertically integrated public monopoly to a competitive power sector through structural, regulatory and ownership reforms was strongly encouraged by the World Bank, International Monetary Fund (IMF) and other international financial institutions in developing and transition countries. The World Bank changed its lending policy for power sector development in 1992 from traditional project lending to policy lending implying that any borrowing country would be expected to adopt the market-based standard reform model. This background explains the appeal of privatisation and market-oriented reforms in developing and transition economies, which, at times, preceded other necessary measures (Jamasb, 2006).

Similarly, in advanced economies, particularly the EU, the reform motives came as an initiative from the European Commission through two electricity directives in 1996 and 2003 (Newbery, 2002; Pollitt, 2012). The EU directive 96/92/EC laid down the foundations concerning common rules towards the creating of an internal market for electricity. The 2003 directive (2003/54/EC) established several key objectives to be achieved by 1 July 2007, such as the creation of an independent sector regulator, 100 percent market opening to all customers including households, legal unbundling of the network segments from generation and supply and free entry in generation via non-discriminatory network access to third parties. The EU Directive 2009/72/EC underscored the need to mitigate the barriers to cross-border trade and expand the interconnections in order to create an integrated single electricity market in Europe.

The structural changes in the electricity sector of developed economies was also a part of the broader series of microeconomic reforms implemented. For example, electricity reform in Australia occurred within the domain of the 'Hilmer' reforms, which advocated a wide reaching competition policy (Quiggin, 1997). However, competitiveness, energy security and decarbonisation are the three main current energy policy challenges and priorities in developed economies (Pollitt and Haney, 2013). The need to achieve a balance between these three competing objectives is driving energy sector policies and reforms in many economies.

4. Analysis of the Reform Experience

Assessing the effectiveness of electricity reforms is difficult as it includes different interrelated steps, can occur in different forms or models and is a dynamic process (Pollitt, 2009). The process also involves institutional and organisational issues, such as the degree of intervention and the degree of competition including unbundling versus vertically integrated structures (Anaya, 2010). Hence, the market-based reform measures are multi-dimensional activities with many interacting factors and a variety of impacts that a Social Cost Benefit Analysis (SCBA), econometric studies, macro studies and studies based on efficiency and productivity analysis may inadequately capture. Hence, we use case studies to analyse differences in the progress and outcomes in small electricity systems in the less developed and transition economies since the early 1990s. The case studies illustrate the importance of tailoring regulatory reforms – even those commonly described as the "standard reform model" (discussed above) – to reflect local context.

The electricity sectors of Nepal and Belarus are chosen for this purpose. These electricity sectors respectively represent smaller electricity systems of less developed and transition countries. Structural changes in the power sector in these countries have varied in terms of context and motives. These case studies will allow drawing out relevant lessons and policy recommendations based on their reform discourse as these countries are at different stages of economic development and at varying stages of the market-oriented process. Nepal is a developing country in South Asia with a small electricity system that is struggling to cope with increasing electricity demand and lingering political instability. The Nepalese electricity sector began its reforms in the early 1990s, due to conditional lending pressures from international financial institutions. However, there exists a gap in the literature regarding case studies of the power sector reform in small electricity systems such as Nepal. The findings from our case study can provide important lessons for several Asia and Africa countries with small state-owned and controlled 'systems'. Many of these countries are experiencing growing political instability and increasing electricity demand.

Belarus is a transition economy that experienced electricity reforms in the context of overall and far reaching macroeconomic reforms. The economic reforms began soon after the collapse of the Soviet Union. In particular, large-scale privatization of the electricity sector was part of a deep political and economic transformation among the transition countries. Therefore, reforms should also be understood and explained in the wider macroeconomic context in these countries (Pollitt, 2009a). However, the impacts of reforms on the power sector of countries of the Commonwealth of Independent States (CIS) region such as Belarus with a relatively smaller sector remains less studied.

4.1 Nepal

Nepal (officially the Federal Democratic Republic of Nepal) is a less-developed landlocked economy in South Asia sandwiched by two of the world's fastest growing and energy hungry economies India and China. It has a geographical area of 147,181 square kilometres and a population of about 27 million. Per capita income is about 1,200 US dollars in purchasing power parity (PPP), meaning it is a low-income nation. The country has a low Human Development Index of 0.46 while Transparency International perceives Nepal as one of the more corrupt countries in the world ranking 154 out of 182 countries in 2011.

Electricity sector reforms have been attempted since 1985 with the establishment of the Nepal Electricity Authority (NEA) (Thakur, 2002). NEA is a vertically integrated (although functionally unbundled) monopolistic state-owned and controlled entity responsible for the generation, transmission and distribution of electricity across the economy. The establishment of NEA eventually paved the way towards a legislative framework and the corporatization of the sector through the formulation of the hydropower development policy of 1992. The Water Resources Act enforced this framework and the Electricity Act with amendments made to the NEA Act of 1984 (ADB, 1999).

The Electricity Act led to the opening of the generation segment to private domestic and foreign IPPs through non-recourse financing whilst allowing NEA to function autonomously, at least in theory. The entry of the private sector in generation implied

that NEA's status changed from that of a sole monopoly to a licensee with the responsibility for buying the privately generated power under a Single-Buyer Model (SBM). In addition, the Community Electricity Distribution Bye Laws were introduced in 2003 with the objectives of promoting public participation in reducing non-technical power losses (such as electricity theft), institutionalising distribution, and encouraging community management in the extension of distribution lines to promote rural electrification.

However, after more than two decades of reforms, the outcomes seem to have failed to meet the objectives. The vertically integrated system has developed to only around 0.72 GW out of a potential of more than 40 GW of generation capacity, including the IPPs' generation. This lack of investment in generation has occurred while the peak demand is projected to further increase to 2206 MW by 2020 and 3679 MW by 2030 (NEA, 2010). The result has been a pernicious cycle of extensive planned outages (on the order of 16 hours per day) to ration supply. Electricity prices remain too low to cover the costs or support system expansion and suffer from persistent cross-subsidization among domestic and industrial customers. The price-cost gap has exacerbated the financial ill health of NEA, with an overwhelming loss of Nepalese Rupees (NRs) 4681 million in 2009 (NEA, 2009).

Likewise, technical and non-technical losses remain high in Nepal, as in other South-Asian countries (Smith, 2004). Electricity losses amounted to 25 percent of the total generation in 2011 due to power theft and technical issues such as antiquated grid infrastructures and inadequate metering in the face of increasing national demand for electricity (NEA, 2012). In terms of access, NEA currently serves 15 percent of the total population with electricity indicating very low levels of electrification under conditions of large disparities among urban and rural customers. The electrification rate in urban areas is 90 percent serving 9 percent of the total population while the electrification rate in rural areas, where the majority of the population reside, is 5 percent. In short, the post-reform Nepalese electricity sector resembles a monopolistic public utility suffering from chronic underinvestment and insufficient capitalization, politically regulated low and distorted tariffs coupled with low access, frequent supply interruptions, and widespread financial and operational inefficiency.

Ongoing, decade long political instability led to policy uncertainty as well as weak or stalled implementation of electricity reforms. Persistent political instability has also placed constraints on the timeframe for undertaking reforms, as any reform that extends beyond the lifespan of the government becomes politically infeasible (Bhattacharya, 2007). Hence, political stability is essential as reforms imply changes in institutional arrangements, which can only sustain through political will, primarily as the government is the primary rule-maker in the Nepalese context.

Under the circumstances, tariffs reforms, increased private sector participation and improvement in governance mechanisms through the establishment of an effective independent regulatory body seem more urgent than the unbundling of NEA (Nepal and Jamasb, 2012b). An effective regulatory body can facilitate private participation in the sector and act as a mechanism to shield the sector from political instability, thus strengthening incentives for investments in generation by setting fair terms for entry and access. It is necessary for smaller less-developed economies such as Nepal to undertake cautious restructuring at first as effective regulation is a complex and difficult task even in developed economies. As the sector grows larger and stronger in the longer run, vertical separation of the networks and privatisation become options. In the shorter term, accounting separation of the competitive and monopoly segments is to promote transparency, accountability and prevent corruption.

4.2. Belarus

Belarus (officially the Federal Republic of Belarus) is a landlocked transition economy in Eastern Europe bordered by Russia, Ukraine, Poland, Lithuania and Latvia. It has a total area of 207,595 square kilometres and a population of 9.7 million. Per capita income is estimated at 15,000 US dollars in PPP terms, implying an upper-middle-income economy. The country has a high HDI score of 0.76, while the Transparency International identifies Belarus as a highly corrupt country, with a rank of 143 out of 182 countries in 2011.

The electricity reform process has been slow in Belarus since it declared independence on 25 August 1991, and only features some initial aspects of market-based reforms. The electricity sector is dominated by the state-owned and controlled

holding company Belenergo created in 2006, comprising six regional power system enterprises responsible for the generation, transmission and distribution of electricity. Belenergo serves as the single buyer of power, including imported electricity, and there are no IPPs. The reliance on imported energy (crude oil and natural gas from Russia as well as electricity) coupled with upward surging electricity demand implies that energy efficiency remains a core goal for electricity reform in Belarus (Rakova and Pavel, 2005). For Belarus, as with other transition countries, electrification is not an issue. Instead, there is increasing emphasis on economic and operational efficiency of the sector (Stern, 2009).

The 'Law on Energy Saving', enacted in 1998 and amended in 2006 sets out the need to promote energy efficiency as a matter of national priority while setting various targets in reducing energy intensity from 2005 levels. Likewise, the 'Law on Renewable Energy Sources' was adopted in 2010 and sets out the directions of state regulations concerning the use of non-traditional and renewable energy sources as the country aims to become energy independent and address its unbalanced fuel portfolio situations (REEEP, 2012). However, there is no explicit 'electricity law' in Belarus.

Belarus is planning to create a functioning wholesale electricity market by 2015 motivated by reform experience elsewhere in the world. The details are laid down in a new Electricity Bill (BELTA, 2012). The creation of a wholesale market is expected to attract foreign direct investments, make spending transparent and reduce generation costs. Belarus, Russia and Kazakhstan are also working on the conception of creating common electricity market in reliance on agreed principles (CEER, 2014). However, the creation of a wholesale market alone cannot accomplish these objectives. The market also must provide adequate incentives and security for investments and for holding down costs.

The Belarusian electricity market faces several fundamental concerns. Capacity shortages and security of supply concerns continue to drive the electricity market as the system relies on imported gas for meeting 90 percent of its electricity demand, with the remaining 10 percent imported from Russia, Ukraine and Lithuania. The load forecast for 2020 is expected to reach 13,000 MW from the existing installed capacity of 8,247 MW, when around 60 percent of the power plants already are operating

under tightening capacity (Zachmann et al., 2008). Electricity prices are politically regulated and well below the Long Run Marginal Cost of electricity supply (LRMC), as well as low compared to other transition countries (EBRD, 2004).

Electricity losses in the transmission and distribution networks are 11.3 percent of the production in Belarus, nearly twice the OECD average of 6.8 percent (IEA, 2008). The electricity market lacks transparency due to vertical and horizontal integration of the industry coupled with the absence of any clear separation of government from commercial management and economic regulation of the industry.

The slow and politically constrained reform process in Belarus is, to some extent, is a consequence of past economic and political conditions. Nonetheless, Belarus needs to restructure and eventually privatize the sector in the path towards creation of a wholesale market and increased transparency. However, privatization should be pursued only after creating an effective institution to govern the privatization process. Creating independent regulators will ensure the governance of opening the Belenergo network to third parties on a clear non-discriminatory basis along with incentives for cost reduction without service quality deterioration. The gradual increase in residential prices up to the LRMC with no direct subsidies and cross-subsidies is essential to make the market sustainable.

Transition economies such as Belarus need to harmonise the inter-sectoral economic reforms to make these reforms workable (Nepal and Jamasb, 2012a). Complementary reforms should be carried out to resolve structural problems in the largest electricity consuming sectors and reform of electricity prices should be accompanied by reform of gas prices under a competition policy framework.

5. Discussions

The case studies of Nepal and Belarus underscore that significant heterogeneity exists in the circumstances behind power sector reforms processes and outcomes among the small electricity systems located within the developing and transition economies respectively. However, the results from these case studies need to be cautiously

generalised. For example, policymakers in favour of the standard reform model may generalise the progress of reforms in pioneer countries such as Chile to conclude that market-based reforms can be successful when implemented properly. In contrast, those critical of the reforms can generalize the outcomes of the slow and unstable market-based reforms in a number of countries in Eastern Europe, Asia[5], Latin America and Africa in concluding that the reforms have been costly and unsuccessful. Even Chile has experienced power sector problems in the last decade despite being a prime example of successful market-based reform in Latin America (Anaya, 2010). Hence, it is necessary to draw out relevant lessons and policy recommendations based on the reforms as observed from experiences of different smaller electricity systems but at different stages of the market-oriented reform process.

It is clear from the case studies that the application of the market-driven reform process has been erratic in developing and transition countries since nearly three decades of reforms and restructuring of the electricity sector, especially across small electricity systems. Imposing cost-reflective prices is necessary in developing and transition countries to make their systems financially and, ultimately, operationally sustainable. However, this should be carried out in the presence of a cautious re-balancing mechanism between economic efficiency and social equity to offset the undesirable social effects of a hike in tariffs. For example, pricing reforms can be made before privatization rather than after privatization for socio-economic reasons if privatization of the electricity companies is considered a reform option in less-developed countries.

The privatization experiences in some LACs also garnered public opposition due to the failure of liberalized reform process to deliver for the poor while being linked to bad governance and corruption (Roland, 2008). Those experiences also highlight the need to have a competent and resourced regulatory agency in place when moving ahead with contractual arrangements via Power Purchase Agreements (PPAs) between the IPPs and the incumbent (Guasch et al., 2006). This is because consumers can only benefit from efficiency gains of privatisation in the presence of a good regulatory body. Passing gains from reforms to consumers also increases the social

[5] The Indian state of Orissa provides a clear example where the application of the market driven electricity reforms truly failed (Sen and Jamasb, 2013).

legitimacy of reforms. Social legitimacy and public acceptance of reforms are crucial factors in tackling the traditional problems of power theft and non-payment in most of the transition and developing countries.

Governance reforms are also crucial to reduce corruption and the issues of non-payment, including through independent regulation, reducing corruption alongside sustainable electricity prices may be more important in developing and transition countries than the immediate implementation of the standard model. The application and sequencing of reforms in less developed and developing countries needs to be sufficiently country-specific to reflect individual country circumstances and priorities (Nepal and Jamasb, 2012b).

The early success stories also demonstrate that market-based reforms require the presence of appropriate institutions and effective governance mechanisms. Chile had well designed economic institutions in place to buttress market-based reforms in the sector. Hence, it is essential that appropriate governance mechanisms be put in place so that the social and institutional capacities of the country are able to support the reforms being implemented. In addition, it is desirable that political objectives not be prioritized at the cost of sound economic principles. A better understanding of the political economy of electricity reform needs to be developed to inform the reform design and process in developing and transition countries.

The lack of adequate network investments is a critical issue for developing countries, even though the current principal concern with reforms is mostly associated with generation adequacy and easing capacity shortages. It is inevitable that the existing grid in these countries cannot accommodate all electricity generated as generation continues to expand to meet the growing demand. An increase in renewable energy will exert additional pressure on the existing grid in terms of integrating generation into the transmission and distribution networks. The simultaneous failure of three of India's five regional transmission grids, which left roughly 600 million people across twenty states without electricity over a period of approximately two days in July, 2012 (Sen and Jamasb, 2013), is an important reminder of the need for developing countries to invest in power infrastructures and management of growing demand.

6. Conclusions

This paper has assessed the process and outcomes of market-based reforms evolving the smaller electricity sectors of the less developed and transition countries based on country-specific case studies. The electricity sectors of Nepal and Belarus were analysed. The reform process in these countries vary in terms of motives, context and sector size. The case studies are used to indicate that reforming the sector is a major economic, political and social challenge across these countries. Moreover, the processes and outcomes are greatly dependent on local context.

This study reiterates the doubts on the benefits of expanding competition arising just from implementing market driven reforms in smaller electricity systems of developing and transition economies. Further research is required to estimate the relevant costs and benefits of electricity reforms in small systems, in developed, developing and transition economies – a currently under-researched area implying a considerable knowledge gap.

It is evident from the case studies that the reform processes in developing countries remain works in progress. The majority of less developed and developing countries continue to be at various stages of the standard reform model with stalled progress. The active involvement of the state in the sector across developing countries also has often demonstrated the political failures in electricity sector management and operation, is as evident among some transition and most South Asian countries.

Electricity reforms across the small systems in developing and transition economies can be multi-staged. The short-term reforms can focus on tariff and subsidies restructuring and creating an effective independent regulatory body. Policymakers had ignored the importance of establishing an independent regulatory body during the early reform period. Strong governance and proper institutional arrangements can control corruption, theft and install resistivity towards political shocks in the sector. IPPs entry should be facilitated and encouraged by minimising market and non-market barriers while an independent regulator is necessary to implement the electricity reforms in these countries. Complete vertical separation of the networks

and creating a wholesale market by horizontally splitting the generation segment remains an option as the system grows larger in the long run in developing and transition countries with the increasing electricity demand and growing population.

Hence, successful electricity reforms require coordinated progress across aspects of the development process, namely political, macro-economic, sectoral, and financial. The interplay among economic, social and political factors complicates the reform process. New economic, political and technological challenges will drive the sector as market based reforms continue to progress (or halt) across developing countries, though at varying speed. The main lesson learned from the global experience with electricity reforms is that they are complex and will remain work in progress for some time to come.

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